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year and now issued in pamphlet form, include one "On Fermentation," by Dr. Sedgwick, which is a model of simplicity coupled with accuracy. Excellent figures are given of yeast plants and many forms of Bacteria.—Dr. Rothrock has been studying the microscopical distinctions between good and bad timber, some of the results of which he embodied in a paper read before the Am. Phil. Society, Feb. 2, 1883. A plate accompanies the paper. We should like to see more work like this done.—In the April *Journal of Botany* appears a list of "New genera and species of Phanerogams published in periodicals in Britain in 1882," which ought to find a counterpart in some of our American journals for American plants.—J. C. Arthur describes and figures a new variety of the common walking-leaf fern (*Camptosorus rhizophyllus* Link., var. *intermedius*) in the April *Bot. Gazette*. It approaches *C. sibiricus* in shape of leaf and character of the fibro-vascular bundle. It was collected on limestone cliffs in Eastern Iowa.

#### ENTOMOLOGY.<sup>1</sup>

THE NEW CLASSIFICATION OF THE COLEOPTERA OF NORTH AMERICA.—This important work, prepared by Drs. LeConte and Horn, and to which we referred to on p. 515 of last year's *NATURALIST*, has just been published by the Smithsonian Institution as No. 507 of its *Miscellaneous Contributions*. Its appearance will be hailed with joy not only by coleopterists in this country, but by all those interested in Entomology. It is a stately volume of 567 pages, and though the general arrangement of matter is as in the first "Classification," the present volume is much more than a mere second edition thereof. In the former work the Phytophaga, Rynchophora and what was formerly known as Trimeria were not reached, whereas the new classification covers the whole order, is almost entirely re-written, and is brought up to date.

The general arrangement of the families is in the main that proposed by Crotch, with but one important change, viz., that the Serricornia are placed before the Lamellicornia, the authors justifying this change by the close relationship existing between some members of the Clavicorn series and the Serricornia. This relationship, in the arrangement usually adopted, was interrupted and obscured by the interposition of the Lamellicornia.

The Platypsyllids and the Stylopids are given but family rank in the Clavicornia and Heteromera respectively.

To the beginner we especially recommend a careful study of the introduction, which gives a very clear exposition of the external anatomy of the Coleoptera, illustrated by original figures drawn by Dr. Horn.

<sup>1</sup> This department is edited by PROF. C. V. RILEY, Washington, D. C., to whom communications, books for notice, etc., may be sent.

A welcome addition to the volume is Mr. Henshaw's bibliography, consisting of a complete list of references to all the monographs or synopses of families, genera or species that have been published.

A PRETTY AND UNIQUE GALL-MAKING TORTRICID.—In May, 1882, we received through Mr. H. K. Morrison, from Ft. Grant, Arizona, some elongate galls—mere swellings of the stem—on a sensitive plant, *Acacia felicina*. The moths issued during June and July, and proved to be one of the most striking, pretty and exceptional Tortricids known. The accompanying figure will show the general markings, but will convey no adequate idea of the beautiful coloring which is chiefly pruinose, resembling the delicate bloom on a damson with a terminal band of delicate crimson, contrasting with streaks of metallic steel-blue, deep rich brown, straw-yellow and carneau. We append a description under the genus *Grapholitha*, with which it has the closest affinities and to which Lord Walsingham, who has examined specimens, would refer it.—C. V. Riley.

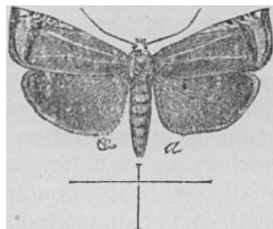


FIG. 1.—*Grapholitha ninana*; hair-lines showing natural size.

*GRAPHOLITHA NINANA*, n. sp.—Average expanse 1.9 mm. Head with the face and palpi delicate sulphur-yellow; top pink; antennæ dark-brown or black. Thorax bluish-gray with variable metallic shades according to direction of light, the collar being more lilaceous. Primaries pruinose, the general color delicate purplish-gray with a pruinose bloom and with two longitudinal streaks of deep carneau, the inner border margined with a streak of same color. Costa pale straw-yellow with a series of six brown-black, costal spots (sometimes one or two intermediate ones indicated) which, with the yellow, widen toward the apex, the terminal spot being transversely oval and sub-apical; the first is linear, begins about the middle of wing and connects more or less distinctly with a black line which obliques posteriorly and makes an elbow almost at right angles across the terminal fourth of wing; a black-terminal line also runs from sub-apical spot along posterior border, the intervening space between these lines being of a delicate pink verging in places to crimson, with metallic, pale, steel-blue or lavender lines as follows: one coincident with elbowed black line posteriorly and broadest across the wing, an abbreviated one under the third costal spot, a longer one connecting that on oblique line, and a still longer one, slightly waved, extending from spots three to six. A few such metallic scales are sometimes in the pink field, and more often on inside of transverse black line, while some black scales are also observable in the pink field (three specimens); fringes brown, faintly metallic; secondaries dark brown with pale fringes; wings beneath dark brown, strongly iridescent, the costal marks repeated, a pale basal streak along middle of primaries and a more distinct one running the whole length along the upper third of secondaries; legs pale, the tarsi annulate. Abdomen concolorous with secondaries.

Described from four ♂s, three ♀s. Slight variation in minute details, and but unimportant colorational differences between the sexes.

SIMULIUM FEEDING ON OTHER INSECTS.—Dr. Hagen (the *Entomologist's Monthly Magazine*, April, 1883, pp. 254-5) considers that Simulium may, after all, prove useful to man by causing the destruction of large numbers of chrysalides of *Pieris menapia*, which is so injurious to pine trees in Washington Territory, Al-

though no direct observations were made on the subject, Dr. Hagen thinks that the black-flies attack and suck the helpless chrysalides. That *Simulium* can subsist on insect blood is not strange, since fleas and mosquitos are known to so subsist, and the correctness of the belief seems to be corroborated by the circumstance that in those places where the *Pieris* abounded *Simulium* molested neither man nor beast; while where the butterfly was wanting the travelers were exposed to the usual annoyance by the flies.

LONGEVITY IN A BEETLE.—Dr. D. Sharp notes (*Entomological Monthly Magazine*, April, pp. 260-1) that he kept a female of a water-beetle (*Dytiscus ræselii* Fabr.) alive for nearly five years, and that during the first two years a male accompanied her. Copulation between the two insects was actually observed, yet a post-mortem examination of the female showed the ovaries very small, the tubes containing no eggs, and, so far as known, the beetle never deposited any.

Dr. Sharp explains this fact that, in his experience, it is very difficult to get the larger Dytiscidæ to oviposit in confinement, and that the eggs are only developed in the ovaries under circumstances suitable for their deposition.

SYNOPSIS OF THE N. A. HELIOTHINÆ.—Mr. John B. Smith gives us, in the Transactions of the American Entomological Society (Vol. x, pp. 205-255) a synopsis of this sub-family, or group, as he prefers to term it. The paper is illustrated with two plates, one of outlines showing the typical venation of the primaries, the armature of the front tibiæ, and some forms of the clypeus; the other of shaded wings which seem to be produced by the photo-engraving process and are extremely unsatisfactory, a fact due, probably, more to the character of the drawing than to the process. The Synopsis will be of service to students of the sub-family, and shows rather forcibly the loose character of much of Mr. Grote's work, which, except as to specific descriptions, must surprise and perplex all who conscientiously study the Noctuidæ with a view of getting at their true relations. Mr. Smith modestly admits that no really scientific classification of the sub-family has yet been made, and that his classification may be entirely superseded. The fact is that our Noctuidists have been governed rather by individual opinion than by the conviction which serious study brings, in their ideas as to the value of genera, and as Mr. Smith well remarks, there are almost as many different courses as authors. Mr. Smith, who in a previous paper (*Canadian Entomologist*, April, 1882) has shown how few reliable generic characters the Noctuids present, has, in the Heliothinæ, depended on the form of the eyes, of the clypeus, of the vestiture of the thorax and on the structure of the tibiæ, finding the venation very uniform and of no generic value. His paper is a calm and conscientious at-

tempt at a correct arrangement of the sub-family. Where trivial characters are deemed of generic use we think wing design or ornamentation should not be entirely neglected, but might be considered with advantage. Mr. Smith cites a few larvæ, but a number more are known, and where those of species such as *Heliothis armigera* (Hubn.) and *H. dispaceus* (L.) [*phlogophagus* Grt.] have been so long known and fully described, nothing is gained by quoting later and less complete descriptions.

STYLOPISED ANDRENÆ.—In the *Entomologische Nachrichten* for March 1, 1883, there is an interesting article by Mr. H. Friese on the successful collecting of *Stylops aterrimus* by digging up in winter time the colonies of *Andrena pratensis*. He remarks that, according to his observations, the styloposed Andrenæ have a much denser pubescence on the abdomen than those not infested with the parasite.

DEATH OF PROFESSOR ZELLER.—It was with deep regret that we received the announcement of the death from heart-disease on the 27th of March at Grünhof near Stettin, Prussia, of Professor Philip Christoph Zeller. His chief entomological work was on the Lepidoptera and especially on the smaller moths, as the Noctuidæ, Tineidæ, Tortricidæ and Pyralidæ. Of late years he published much on American species and his work was of the most trustworthy and thorough character. He wrote us a long and pleasant letter on the 20th of February last, sending us at the same time a number of his types of N. A. species which proved most instructive. We had just prepared a box of specimens to send him in return when the sad news reached us. Zeller was born April 9, 1808. He was beloved by all who knew him, and his place cannot easily be filled.

FIG CAPRIFICATORS.—Two interesting articles upon the so-called "fig insects" are contained in Part I of the Transactions of the London Entomological Society for the current year. Sir Sidney S. Saunders gives reasons in detail for differing from Westwood as to the position of these caprificators, and concludes that they are Cynipids, giving the following arrangement of them :

#### CYNIPIDÆ Westw.

##### SYCOPHAGIDES.

#### Division 1.—Prionastomata.

*Blastophaga* Grav.

*Agaon* Dalm.

*Sycocrypta* Coquerel.

*Eupristina* S. Saund.

*Pleistodontes* S. Saund.

*Kradibia* S. Saund.

#### Division 2.—Aploastomata.

*Sycophaga* Westw.

*Apocrypta* Coq.

PROTECTION OF INSECT COLLECTIONS.—The power which Tro-goderma and other Dermestid larvæ affecting insect collections

exhibit in resisting the effects of insecticides is well known. They speedily recover from the effects of benzine; they will live for days in a tight jar filled with camphor or naphthaline, and when they are within some dried insect they are unaffected even by the strongest volatile poisons, such as cyanide of potassium.

There are three prerequisites which we believe to be more important than insecticides in protecting insect collections. They are: 1st, absolutely tight boxes; 2d, the quarantining, for a sufficient length of time, of all specimens received through exchange or otherwise; 3d, the keeping of the boxes closed as much as possible during the time of the year when the parent Dermestid beetles most abound. In the climate of Washington this dangerous period extends from April till June—perhaps a little longer. At any other season there is not much danger from Dermestid beetles.

THE CHIGOE IN AFRICA.—It is stated in Burton and Cameron's "To the Gold Coast for Gold" that the chigoe (*Pulex penetrans*) has been recently introduced and has spread all over the West African seaboard and far into the interior. At the time of Captain Burton's first visit (1862) it was unknown on the west coast; but now it ranks with the indigenous red, white and black ants, centipedes, scorpions, venomous spiders and flies of the tsetse group, as among the chief plagues of that region.

COCOON OF TELEA POLYPHEMUS.—I notice this season that the *Telea polyphemus* as a general thing, if not universally, has fastened its cocoons to the twigs of the maple trees, whereas in previous years it has only fastened them to the leaves and fallen with them to the ground. This year as they are fastened to the twigs, they do not fall to the ground. Is this an unusual thing or not? An answer in the AMERICAN NATURALIST would oblige.—*Herbert Morris, Germantown, Pa.*

[In our experience we have found that while the cocoon of this species is usually found upon the ground where it has dropped with the leaves, yet it is quite frequently attached as above described, and as we have recorded in our Fourth Report on the Insects of Missouri (1871).]

THE SUCKING ORGANS OF BEES, BUGS AND FLIES.—Dr. K. Kræpelin has described in the *Zoölogischer Anzeiger* the mouth organs of the bee and certain Hemiptera and flies. In the humble bee the tube is composed of the labial palps and the maxillæ, which are connected with them by strips of [chitinous] substance; near their lower margin the paraglossæ intervene between the palps and the maxillæ. The half-canal formed by the upward curve of the margins of the labium gradually disappears towards the posterior part of the latter, and allows liquid which has passed down it to escape between the labium and maxillæ into the mouth, at the point of origin of the paraglossæ. Besides the tac-

tile hairs certain peculiar clavate pale hairs are placed on the apex of the labium, which appear from observations to be analogous to the olfactory hairs of the inner pair of antennæ of Crustacea, and, as they carry a minute opening at their ends, must be considered as either gustatory or olfactory organs.

Like that of butterflies, the sucking-tube of the Hemiptera is made up exclusively of the two maxillæ, which unite in such a way as to form a double cylinder, the upper division of which carries the food, the lower the salivary secretion. The mandibles lie by the side of the maxillæ, and can move about on the tube. The end of the labium is provided with terminal nervous organs. In the proboscis of Diptera the sucking tube is formed mainly by the labium, which consists of a demi-canal, closed below partly by the mandibles which are connected with it by a groove-and-ridge joint and partly by the hypopharynx, which runs below the mandibles, carrying the salivary canal; on each side below the hypopharynx lie the maxillæ.

THE "PINE MOTH OF NANTUCKET."—The author, Mr. S. H. Scudder, sends us, under this title, a neatly printed pamphlet of 20 pp., with a colored plate, published by the Massachusetts Society for the Promotion of Agriculture. It embraces an account of the injury to the pines (*Pinus rigida*) on the island of Nantucket by a Tortricid, *Retinia frustrana*, n. sp., with full descriptive details and remedial suggestions, and ends with an appendix giving Professor Comstock's account of injury to the scrub pines (*Pinus inops*) around Washington, as published in the report of the Entomologist, Department of Agriculture, for 1879. Mr. Scudder is inclined to doubt the specific identity of the insect working on *Pinus inops* and *P. rigida* in other parts of the country with his *Retinia frustrana*, but without very cogent reason. After study and comparisons we agree with Fernald and Comstock. This fact of the wide distribution of the species weakens the force of the practical conclusion of the pamphlet, which is that *by breaking or cutting from every pine tree on the island every affected shoot* the insect might be virtually exterminated—a conclusion which presupposes either that the species is confined to the island or that, being more widely distributed, the parent moth could not or would not fly from adjacent land. Mr. Scudder concludes that there are two annual generations. While two have been plainly made out for the latitude of Washington, it is yet doubtful whether more than one occurs, as a rule, so far north as Nantucket. The irregularity in development is apt to mislead, and in studying *Dapsilia rutilana* Hübn, on Long Island, some years since, we were forced to consider it monogenetic notwithstanding the appearance of the moths in early spring.

The popular name chosen by the author is rather unfortunate. Popular names for injurious larvæ are most appropriate when

they apply to the larva state and when they indicate distinguishing habits or characters among allied species.

ENTOMOLOGICAL NOTES.—A Trypeta "gall" discovered by Weyenbergh in the Argentine Republic on the terminal bud of a *Heterothalamus* resembles in appearance the froth produced by the well-known spittle-insect, but is somewhat more substantial in structure.—Mr. S. H. Scudder in *Science* for March 2, 1883, discusses the interesting discovery by Mr. Charles Brongniart, of the fossil Phasmidæ, from the upper coal measures of Commeny, reproducing his sketch of the gigantic *Titanophasma fayoli*.—The *Stettiner Entom.-Zeitung* (1883, Nos. 4-6), contains the following articles of interest to the American student: Möschler's review of the Brooklyn Check List of Macrolepidoptera; on the scales on the wings of Geometridæ and their possible use for classification, by C. von Gumpenberg; continuation of C. Ploetz's Synopsis of the species of *Hesperia*; J. Lichtenstein's description of the Aphidid genus *Schlechtendalia*, and Dr. Rössler's remarks as to the best system of the Lepidoptera.—Une application de l'Entomologie à la Médecine légale, par M. Mégnin, in *Le Naturaliste*, February 1, 1883, relates to the discovery, in a house, of the dried up body of a child, the presence of certain Dipterous and Coleopterous insects in and on the body, enabling Mr. Mégnin to pretty accurately fix the date of the death of the child.—*Xylotrechus annosus* Say, breeds, according to Mr. Coquillett, in willow, the beetle having apparently oviposited in the wood after the tree had been cut down (*Can. Ent.*, Feb., 1882).—Mr. W. H. Edwards indefatigably continues to describe the preparatory stages of North American Lepidoptera, his numerous papers on this subject being, every one of them, examples of careful and conscientious workmanship.—Raphael Meldola discusses the mimicry between butterflyes of protected (*i. e.* unpalatable or otherwise unacceptable to birds) genera by which the more common species is imitated by the rarer (*Ann. and Mag. Nat. Hist.*).—The Proceedings of the Boston Society of Natural History, Vol. xxi, Part iv, January, 1882-April, 1882, published March, 1883, contain the following entomological papers: A new and unusually perfect carboniferous cockroach from Mazon creek, Ill., by Samuel H. Scudder; Notes on some of the Tertiary Neuroptera of Florissant, Colo. and Green river, Wyoming Terr., by Samuel H. Scudder. Another interesting paper, though not directly relating to entomology, is by Wm. Trelease on the structures which favor cross-fertilization in several plants.—Mr. G. N. Milco, superintendent of the Buhach Producing and Manufacturing Co., Stockton, Cal., estimates this year's Pyrethrum crop of the company's farm in Mercer county, to be at least forty tons.—Fritz Müller shows (*Kosmos*, March, 1883, p. 448) that chrysalides of *Papilio polydamus* from larvæ raised under like conditions were of varying color, a fact that holds equally true of our own Papilios. He



also criticizes (*ibid*, pp. 466-9) Hagen's paper on "The color and pattern of insects."—Dr. Edward Hoffer (*ibid*, pp. 412-421) gives some interesting facts as to the nest-building of humblebees.—We regret to see that with the change of political power in California there has been a change in the officers of the Horticultural Commission that does not seem to be an advantage. Bitter complaint is made, for instance, of the removal of Mr. Matthew Cooke, who has been indefatigable in his labors on the commission.—Some vine cuttings from Madeira were recently held in New York in the belief that they were affected by Phylloxera. Specimens were sent by Collector Robertson to the State Department and finally submitted to us for examination and suggestion. We advised their immediate forwarding, as there were no grounds for their detention.

### ZOÖLOGY.

THE EMBRYONIC TENTACULAR KNOBS OF CERTAIN PHYSOPHORES.—While investigating the anatomy of the tentacular knobs of several genera of Calycephores, I was struck by their close resemblance to the "embryonic knobs" of Agalma.

If the terminal filament of the Calycephore knob be reduced to nothing, we have left a tentacular appendage homologous with the embryonic knob of Agalma, Physophora, Agalmopsis and other Physophores. This resemblance seems to me to have a genetic significance, and to indicate a relationship between two great groups of Siphonophora, called the Physophoræ and Calycephoræ. In order to strengthen this supposition I was led to search out other resemblances in the larvæ in which these structures are found. The result was that an interesting likeness between the single ("embryonic") nectocalyx of Monophyes and the "primitive scale" of Agalma was found. The following reasons led me to regard these last-mentioned organs as homologous. Both are formed in the same way, both are embryonic and are lost in subsequent development. We have in the "primitive scale" of Agalma an indication of the point in the development of the Siphonophora, where the separation of the Physophoræ from the Calycephoræ, or where the separation of both groups, from a "stem form," took place. The embryonic bell of Monophyes is an organ of motion; the primitive scale of the young Agalma, although homologous to a bell, has lost the function of motion, and is an organ of flotation, while in Agalmopsis (Halistemma) the embryonic bell is not even represented. The only structure in the larva of Agalmopsis (Halistemma), which shows the relation of this genus to the Calycephoræ is an embryonic tentacular knob, like that of the larva of Agalma, which is thought to be homologous to the tentacular appendage of the Calycephores. This statement of a possible genetic relationship between these